

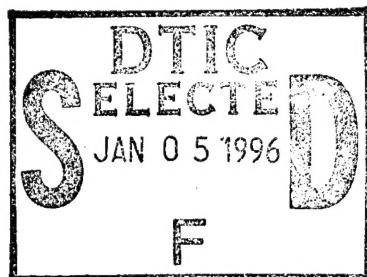
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December 19, 1995

Joel L. Davis
Program Manager/Officer ONR: 342
Office of Naval Research
Ballston Tower One
800 North Quincy Street
Arlington, Virginia 22217-5660



Dear Mr. Davis:

Please find enclosed the Quarterly Report and the Appendix for ONR Grant N00014-95-1-1312, entitled "Evaluation for Vibrotactile Systems in Helicopter Hover and EVA Environments." This Report is for the dates of September 1 through November 30, 1995.

Sincerely,

A handwritten signature in cursive ink that reads "Dava J. Newman". Above the signature, the letters "CB" are written in a smaller, printed font.

Dava J. Newman
Assistant Professor of Aeronautics and Astronautics

DN:cb

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1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED	
	12/18/95	QUARTERLY (9/1/95 - 11/30/95)	
4. TITLE AND SUBTITLE EVALUATION FOR VIBROTACTILE SYSTEMS IN HELICOPTER HOVER AND EVA ENVIRONMENTS			5. FUNDING NUMBERS GRANT Number N00014-95-1-1312
6. AUTHORS(S) NEWMAN, DAVA J.			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) DEPARTMENT OF AERONAUTICS AND ASTRONAUTICS MASSACHUSETTS INSTITUTE OF TECHNOLOGY 77 MASSACHUSETTS AVENUE CAMBRIDGE, MASSACHUSETTS 02139-4307			8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) OFFICE OF NAVAL RESEARCH BALLSTON TOWER ONE 800 NORTH QUINCY STREET ARLINGTON, VA 22217-5660			10. SPONSORING/MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES			
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 words) The vibrotactile (VT) advanced technology demonstration (ATD) introduces a novel human-machine interface, namely, haptic stimulation through a VT suit to improve military personnel performance. The complete vibrotactile (VT) suit system will include three main components: a sensor package to acquire motion and orientation information, a control computer that will condition and convert the sensor information into output drive signals, and the VT suit for the test pilots. Design solutions for a navigation sensor package to be used in helicopter hover and extravehicular activity (EVA) environments is currently being undertaken (See Ref. List). Integrating an Inertial Navigation System (INS) with the Global Positioning System (GPS) has provided numerous benefits, and with the recent advances in Kalman filtering techniques, the number continues to grow. In addition to increased navigation accuracy under dynamic conditions, tracking accuracy has improved, CPU time has decreased and crew workload has decreased. The dual IN/GP system has already proven its strength in a variety of capacities such as helicopter flight path control, flight path management, flight testing and helicopter approach. While research efforts continue to establish a portfolio for this dual system, much of the present attention had been given to reducing the development and acquisition costs.			
14. SUBJECT TERMS			15. NUMBER OF PAGES
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL

Appendix: ONR Grant N00014-95-1-1312, First Quarter Reference List

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